THE PROVISION OF OCCUPATIONAL HEALTH AND SAFETY SERVICES TO EMPLOYERS WITH SMALL WORKFORCES:

A REVIEW OF THE LITERATURE

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ABSTRACT

This paper reviews the literature on the provision of occupational health and safety (OHS) services to employers with small workforces, and ends with recommendations concerning the delivery and evaluation of OHS services to small employers. Sources for the literature search included the card catalogue and a key word of context search in the Occupational Health and Safety Library (Edmonton), the card catalogue at the University of Alberta Library, various indexes, a list of bibliographies, plus a manual search of some journals.

The literature was summarized under four categories: definition, need, approaches and evaluation. Definitions ranged from "4 or fewer employees" to "less than 1000 employees." Most countries and organizations used definitions falling in the range between "less than 50 employees" and "less than 300 employees." A definition of "less than 50 employees" was recommended for the Alberta situation.

Concerning need, there was general agreement among authors that small employers have inadequate OHS services. However, only a few authors documented specific evidence on inadequate services. There was statistical evidence that in Alberta, 42% of small employers are concentrated in the four highest hazard industries, which could indicate a need for OHS services.

A variety of approaches to service delivery were discussed in the literature, including co-operative programs, the employment of a part-time physician, a shared OHS nurse, mobile dispensaries, private OHS companies, and services provided through public health or community centers. The great

majority of services offered are oriented toward occupational health rather than toward safety services. The literature was seriously lacking on reports evaluating OHS services delivered to small employers.

While ideally all small employers should be studied, it was recommended that in Alberta an initial study be carried out on small employers in the construction industry to document health and safety hazards and gather other information relevant to the delivery of OHS services. Construction was chosen because it is a hazardous industry, and almost one third of small employers in Alberta are concentrated in construction. If the survey confirms a need for OHS services, a pilot program for service delivery to small employers in construction could be developed, implemented and evaluated. If a decision is made to develop a pilot program, subsequent research should include attitude and background characteristics of small employers in construction, and the design of a program evaluation mechanism.

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INTRODUCTION

The purpose of this report is t identify, document and critique the different approaches that have been taken in providing occupational health and safety services to employers with small workforces. The report is based on a review of existing occupational health and safety literature on this topic.

A variety of literature is available on approaches to the delivery of occupational health and safety services to small employers. In the literature surveyed for this paper, there were quite a few articles devoted to a brief general listing of types of services available, and/or a general discussion of the small employer's need for occupational health and safety services. A few of these articles were valuable reports of research in the area of needs (for example the Scandinavian studies); others were anecdotal in nature, relating short personal experiences and opinions. Eight of the articles surveyed were devoted to the description of a particular occupational health and/or safety service delivery program; one article reported a broad survey of occupational health and safety services in countries outside the United States. A few articles were medically oriented, with technical advice on how to set up occupational services in industrial plants.

I. DEFINITION OF SMALL EMPLOYER

A variety of criteria are used to define small employer, depending on the purposes of the agency or author defining the term. Several agencies use specialized definitions, such as the U.S. Environmental Protection Agency which defines small as those who discharge less than 50 thousand pounds of effluent per day. The Minimum Wage Act in the U.S. uses gross annual sales to define business size (U.S. Department of Labor, OSHA 1976:10). The most common criterion used for definition of size is the number of employees. Even within this single criterion, definitions vary greatly.

A. Definitions in the United States

Rieke (1972), describing a private industrial medical clinic established in Portland, Oregon, defined small as under 100 employees (p. 69). O'Connor (1959), discussing the role of the physician in occupational health services to small plants in the U.S., stated that small plants are usually defined as less than 500 employees, but that he saw the necessity for a further subdivision of "very small" plants which had less than 100 employees (p. 585). Hissey (1979), discussing the nurse's role in providing occupational health services to small industries, defined small as any business undertaking which is financially unable to provide its own occupational health services (p. 1630). In the U.S., the Bureau of Labor defines small as having 19 or fewer employees. Congress has a variety of definitions depending on the particular legislation involved (3 or less, 5 or less, 7 or less, 10 or less, 25 or less) (U.S. Department of Labor, OSHA 1976:10). The

American Medical Association, in "Guide to Small Plant Occupational Health Programs," defined small as less than 500 employees (A.M.A. 1962:114). The Small Business Administration has a flexible definition that varies from industry to industry, and may include up to 1000 employees (Ashford 1976:5). In Occupational Safety and Health Administration's Impact on Small Business, the U.S. Department of Labor said that small firms who need the most assistance in providing OHS services are those not large enough to be able to afford any "overhead personnel;" discussion in the book was based on an arbitrary definition of 25 or fewer employees (U.S. Department of Labor, p. 11).

B. Definitions in Other Countries

Other countries also have varied definitions of the number of employees that constitute a small business. In Great Britain, the Boulton Report of the Committee of Enquiry on Small Firms (1971) defined small as less than 200 employees for manufacturing, and set other arbitrary definitions that seemed appropriate for other industries (ex. 25 or less for construction and mining). The Report cautioned that for practical purposes, small enterprises should not be defined too narrowly (Boulton 1971:181). Meiklejohn (1960) also described small enterprises in Great Britain, and defined small as having less than 250 employees (p. 250). In Finland, Tolonen (1979) defined small as less than 100, and also had a sub category of "mini" for firms that employ 4 or fewer employees (p. 2). In Japan, Ohtsuki (1979) described an occupational health and safety co-operative that primarily served small enterprises with less than 300 employees (p. 1503). Ashford (1976) reported the following

international survey of definitions:

less than 50 employees	Austria, Belgium, France, Sweden, Switzerland	
less than 20 employees	Denmark, Ireland, Norway	
less than 100 employees	Germany, Italy, Finland	
less than 500 employees (for some purposes)	Great Britain	
less than 300 employees (manufacturing)	Japan	
less than 50 employees (commerce and services)	Japan	(Ashford 1976:5)

Ashford concluded that definitions varied a great deal, and that one must look at the context and the country when defining small business (Ashford 1976:5).

C. Definitions in Canada and Alberta

In Canada, the Small Business Secretariat of the Federal Department of Industry Trade and Commerce defines small business as one with annual sales of less than $2 million.

Statistics on the size of employers by number of employees are not readily available for Alberta. The table below was constructed from data on Alberta Workers' Compensation Board (WCB) accounts. The category "% of WCB accounts" gives an indication of the actual percentage of employers in Alberta[1] in each size category. The category "% of estimated man-years worked" gives a rough indication of the relative proportion of the workforce that is employed in each category.

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1. Includes only employers with WCB accounts.

NUMBER OF WCB ACCOUNTS AND ESTIMATED MAN-YEARS BY EMPLOYER SIZE, 1981

size category (number of workers)	WCB accounts number	%	estimated man-years number	%
0 - 2	52,601	64.6	42,448	5.4
3 - 9	17,890	22.0	88,225	11.2
10 - 19	5,068	6.2	68,218	8.7
20 - 39	2,793	3.4	76,827	9.8
40 - 99	1.964	2.4	119,884	15.3
100 - 249	756	.9	113,021	14.4
250 - 599	241	.3	90,046	11.5
600 +	130	.2	186,295	23.7
TOTAL	81,443	100.0	784,964	100.0

(from MacKinnon 1983: Appendix A)

MacKinnon (1983) defined a small employer as one with less than 40 employees, and a large employer as 40 and over (p. 1). With this breakdown, in 1981 small employers represented a total 96.2% of accounts, and large employers 3.8%; small employers represented 35.1% of estimated man-years and large employers 64.9%. This seems an appropriate definition for the Alberta situation. However, a cautionary note needs to be inserted here. Several authors in the literature warned that size alone is an insufficient criteria on which to base OHS service delivery. Such factors as kind of business, particular hazards present, and geographical spread of employers should also be taken into account. In the light of international definitions, the most appropriate category for Alberta is "less than 50 employees." Austria, Belgium, France, Sweden and Switzerland all utilize this definition.

However, such a definition is completely arbitrary. If international comparison is considered to be important, then the "50 or less" category is a good choice; if one wants to continue building on the existing definition and available data analysis on small employers in Alberta, then the "40 or less" category is a good choice.

II. THE SMALL EMPLOYER'S NEED FOR OHS SERVICES

A. General Evidence of the Need

The small employer's need for OHS services was one of the most common topics in the literature surveyed, with the majority of authors including a discussion of need. Evidence of the need by small employers for OHS services fell into six main points:

1. Occupational injury and illness occur in small businesses, and can be reduced by occupational health services. Some authors discussed the need for OHS services in a very general way, arguing that since occupational injuries and illnesses exist, and can be reduced by taking proper measures, there is a need for OHS services to small employers (Bond 1975; O'Conner 1959). Buchwald (1981) discussed health problems associated with work, and calculated the annual cost of sickness-absenteeism in Canadian industry (p. N2, N3). Ohtsuki, et. al. (1979) cited the recent increase of disease caused by environmental hazards in Japan as evidence of the need for OHS services (p. 1507). This information points to a general need for OHS services, but more specific evidence relating particularly to small employers is needed to

assess their special situation.

Only one study documented the actual health hazards in small workplaces. This was an extensive study undertaken in Finland by M. Tolonen and other members of the Institute of Occupational Health in Helsinki. Tolonen, et. al., studied 163 small workplaces (defined as less than 100 employees), using a walk-through survey, interviews and questionnaires. The primary objective was to determine the need for actual occupational health services (Tolonen 1979:1). Tolonen, et. al. found that 250 accidents had been reported for these workplaces in 1976, and 22 compensable occupational diseases in 1967 - 1976 (mostly dermatitis and noise-induced hearing loss). The study of the workplaces revealed that 84 plants had one or more vital safety risks in the work environment, but Tolonen warned that it is not easy to calculate how many workers were exposed to the risk of accident (Tolonen and Hassi 1979:51-52). The occupational hygienists in the study concluded that most employees worked under normal, safe, conditions, although 1/5 of employees were exposed to noise (Tolonen and Hassi 1979:52). In other areas the authors found room for improvement in protective clothing, occupational health counseling, first aid preparedness and ergonomics (Waltari 1979; Vaaranen 1979; Vaaranen, et. al. 1979). The authors concluded that while the workplaces were relatively safe and healthy, there were areas that could be remedied by occupational health services (Tolonen and Hassi 1979:54).

Tolonen cautioned that the results of his study cannot be generalized to health centers in other areas because the strategies suitable for implementing and maintaining OHS service delivery depend on local

circumstances such as the type of work force, economic structure, and specific working conditions and hazards (Tolonen and Hassi 1979:50). There were no studies in the literature surveyed that directly examined actual health and safety hazards in Alberta or Canada.

2. Small employers have inadequate occupational health and safety services. a. The main rationale in the literature was that small employers employ a substantial portion of the workforce, but offer little in the way of OHS services to them. Several authors cited statistics on the proportion of the labor force working for small employers. In the United States, Department of Labor statistics from 1972 showed that companies with fewer than 20 people employ 1/4 of the workforce; companies with fewer than 100 employ 1/2 of the workforce (Follmann, 1978:281). In Finland, small industries (less than 100 employees) employ about 19% of the industrial work force, and about 12% of the total work force (Tolonen 1979:2). In Alberta, from 1977 to 1981, small employers (under 40 employees) accounted for 38% of the estimated total man-years worked by Alberta employees; these estimates were based on employer data obtained from the WCB (Mackinnon 1983:8).[2]

Many authors also cited the proportion of businesses that are classified as small. For example, Hardesty (1981) said that more than 87% of businesses in the U.S. employ 25 or fewer workers (p. 590). In Finland, "mini" industries (less than four persons employed) account for 71% of the total

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2. Statistics in the rest of the literature were conflicting and often poorly documented (no source or year given). The conflicts are likely due to varying definitions of "small," along with different sources and years for statistics.

enterprises (Tolonen 1979:2). In Alberta, 92% of work sites have less than forty workers (Buchwald 1981:N7).

Evidence is fairly clear regarding the substantial number of workers employed by small employers, and the large proportion of businesses that are small. The evidence in the literature is not as well-documented for inadequate service delivery to these employees. Authors make broad statements, such as ". . . (occupational health) services are either remote or do not exist for fifty million others who work as individuals or in small units of 10, 20 or 100 (Reike 1972:69)," or "the vast majority of such workers (Americans employed in small plants) are not served by any occupational health program (Committee on Public and Professional Affairs:114)."[3]

While such general statements identify a problem in the area of service delivery to small employers, it would be helpful to have more specific information on the actual availability and utilization of OHS services for small employers. Only two authors cited actual surveys done on this topic. Chen (1979) gave the results of a nation-wide survey in 1970 by the U.S. Civil Service Commission: 370,000 out of two and a half million federal employees were still without access to occupational health services, and 2/3 of these were from small groups or firms (Chen 1979:1554). In a study of small industrial workplaces in Finland, Vihma (1976) found that 16% of small

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3. Similar general statements about inadequate service delivery to small employers are found in Bond (1975:7), Follmann (1978:282), Finch (1977:24), Hardesty (1981:590), Hissey (1980:1630), and Martin (1977:80).

industrial workplaces provided occupational health care, and that such health care services were concentrated in the industries with highest risk exposures (p. 35).

b. A few authors argued that small employers need OHS services because they have a lower frequency of service delivery than large employers. Follmann (1978) cited a 1950 survey by the National Association of Manufacturers in which 20% to 30% more of the companies with 251-500 employees provided occupational health services than the 1-250 group (p. 283). In Alberta, 11% of small employers received Occupational Health and Safety Division Inspection Branch services and/or inspections, compared with 62% of large employers (MacKinnon 1983:20). In this particular area of service delivery, a small employer is less likely to receive services than a large employer. However, this does not necessarily indicate that small employers need more inspection services.

c. A final indication of inadequate services is that first aiders in small plants are doing work for which they are not qualified, because there is no one else to do it. In a survey of work undertaken by first aiders in small industries in Britain, Homewood (1979) found that first aiders were doing work beyond their qualifications, such as health education, counseling, record-keeping, administration and safety activities (p. 1591).

3. There is a concentration of small employers in some hazardous industries. The concentration of small employers in hazardous industries varies from country to country. In the U.S., Department of Labor figures for 1976 showed that 80% of small businesses were in industries with the lowest

injury and illness incidence rates; 60% of large employers were in this category (U.S. Department of Labor, 1976:11).

The situation in Alberta reflects a different distribution of small and large employers than that in the U.S. In Alberta, 42% of small employers are in the four highest hazard industry sectors (agriculture, forestry, manufacturing and construction), while 34% of large employers are in those sectors.[4] Almost one third of small employers are concentrated in the construction industry alone. The hazards involved in construction are indicated by the fact that the construction sector had the highest percentage (35%) of fatalities investigated by the Occupational Health and Safety Division from 1977 to 1981 (MacKinnon 1983:15-16). Thus in Alberta there is a concentration of small employers in hazardous industries.

4. Small employers tend to have more hours lost to injury than large employers. MacKinnon (1983) examined total lost time claims made to the WCB by employers. He found that small employers accounted for 40% of lost time claims, but only 38% of estimated man-years worked. Large employers accounted for 60% of lost time claims, and 62% of man-years worked (MacKinnon 1983:10). Thus, small employers have a slightly higher incidence of lost time claims when compared with large employers.

A National Health Council survey in the United States in 1960 indicated that absenteeism due to illness is greater in smaller places of employment. The same survey also found that small plants have an accident-frequency rate

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4. Data is based on employers with WCB accounts.

two and a half times as high as in larger places of employment (Follmann 1978:280). This high accident frequency rate seems to contradict Department of Labor statistics in which small businesses were found in industries with a low incidence of injury and illness (see point 3 of this section). In view of the contradictory evidence in the literature, there is a need for accurate surveys of the actual incidence of occupational accidents, injury and illness in the small business targeted for OHS service delivery in Alberta. MacKinnon (1983) noted in this regard that small employers are responsible for a disproportionate amount of fatal accidents in Alberta. Small employers accounted for 48% of fatalities, but only 38% of man-years worked (MacKinnon 1983:17).

5. Small employers are generally lacking in occupational health and safety knowledge, and need counseling and educational services. Several authors stated that small employers are likely to be uninformed about occupational hazards, laws, and technical solutions open to them (Ashford 1976:2; Finnegan 1978:20; Homewood 1982:183). Tolonen, et. al.'s extensive study in Finland led to this conclusion:

> ... many employers (in small workplaces) are not only insufficiently aware of their duties, but they also seem to need expertise from outside to help them discover and assess certain occupational safety and health problems...(Tolonen and Hassi 1979:53).

6. Small employers need OHS services to help meet legal requirements. Several authors noted that legal regulations are beginning to require that small employers develop occupational health programs (Follmann 1978:289; Bond 1975:7; Tolonen 1979:42).

B. The Need For Special Services

A pertinent question regarding the need for OHS services is: does the small employer need special service delivery mechanisms? There is some evidence that traditional OHS service delivery mechanisms are not reaching small employers. In 1976 OSHA reported that most of their efforts to disseminate information to small employers (mailing information booklets, Job Safety and Health magazine, radio and television public service messages) have not been effective in reaching the majority of small employers. OSHA surveyed other agencies, who reported similar problems in reaching small employers. OSHA concluded that traditional efforts of communicating with small business employers have not been very effective (U.S. Department of Labor, OSHA 1976:25, 41).

In view of the failure of present occupational health and safety information delivery to reach small employers in the U.S., there is some support for the development of OHS service delivery mechanisms specifically for small employers.

The need for special services for small employers was also implied by authors who mentioned the difficulties involved in delivering regular OHS services to employers too small to be able to fund a full time physician, nurse, or other occupational health and safety personnel (Follmann 1978:282; O'Connor 1959:585; Ohtsuki, et. al. 1979:1507). There are several ways in which small employers differ from large ones, and thus may require different kinds of services. The small employer is typically the owner/manager/recordkeeper of his business, and cannot afford to spend a lot

of time on "overhead" problems like health and safety (U.S. Department of Labor, 1976:12). Previous discussion in this paper noted that the small employer has less knowledge about health and safety principles and requirements than large employers (see A. General Evidence of Need, point 5). The small employer may also lack the capital to make required changes. Large industries are financially and organizationally more able to provide occupational health services (Buchwald 1981:N10). Special service delivery mechanisms may be required because of the particular circumstances and characteristics of the small employer.

III. APPROACHES TO SERVICE DELIVERY FOR SMALL EMPLOYERS

A variety of approaches are mentioned in the literature, although not all are discussed in detail.

1. Arrangement with local medical personnel for periodic or part time services. According to Follmann (1978) the most common approach to occupational health services delivery utilized by small employers is part time nursing in conjunction with periodic visits by a doctor (p. 282). This approach to health services delivery can also take the form of a contract arrangement with a local physician or clinic (Buchwald 1981:N8). In Britain, the government's Employment Medicare Advisor Service hires doctors to conduct medical examinations and give advice to employers on medical matters related to work and health hazards. The employer pays for the examinations, and all other services are free (Ashford 1976:26).

2. Groups of companies join together to provide services for themselves. Two articles discussed programs of this type. Ohtsuki, et. al. described a co-operative program in Japan. In 1940 the Kyoto Industrial Health Association was established as a "private co-operative organization with industrial hygienic activities in minor enterprises in Kyoto (Ohtsuki, et. al. 1979:1503)." In 1976 the co-operative had 254 enterprises, with 86% employing fewer than 300 employees. The main services provided are preventative and clinical services for occupational diseases, medical examinations, research and education, and environmental measurement and control (Ohtsuki, et. al.:1979:1503).

In Britain, Homewood (1982) revisited 5 co-operative pilot projects set up on industrial estates in the mid-sixties, but unevaluated since then. Four of the co-operatives were funded by the Nuffield Foundation, established through the donations of a wealthy English businessman, and the Nuffield Provincial Hospital Trust; the fifth was funded by the District Manufacturer's Association. Presently the member companies pay per capita fees, and the NHS also helps in funding some of the co-operatives. However, their financial situation is precarious, possibly because they are registered charities (non-profit making independent services). Clients include both large and small employers. At the largest clinic, the co-operative employs doctors, nurses, consultants, a social worker, physiotherapists, and a chiropodist. This co-operative operates out of a central clinic, and also has smaller first aid stations and a mobile first aid station. Some of the other co-operatives employ an industrial hygienist and a safety advisor (Homewood 1982, Part 2:225-226).

A fairly well known co-operative in the United States is the Hartford Small Plant Medical Service. It was established shortly after World War II through the joint efforts of six employers, the Connecticut Manufacturing Association, the State Bureau of Industrial Hygiene, and the Connecticut Medical Society. Each plant was required to set up an in-plant dispensary and one full-time registered nurse. The plants shared the services of a physician who travelled to the different plants for weekly visits (Grant 1960:118-119). This level of service delivery was possible because each plant had an average of 500 employees. This kind of service delivery with an in-plant dispensary would not be suitable for very small employers.

3. An occupational health nurse provides services to companies in a selected area. A pilot program of this type has been organized in Sydney, Australia. The program was set up in 1975 when the Health Commission of N.S.W. received a Federal Government grant to start advisory occupational health nursing services to small industries. One occupational health nurse is appointed to each of five areas of small industry in Sydney. The nurse provides advice on occupational health hazards, and education on occupational health principles and hygiene. In addition, first aid equipment is checked and some first aid training is done. Specific environmental monitoring for pesticides is also carried out (Hissey 1979:1629-1630).

4. Mobile dispensaries provide services to a number of employers. Ashford (1976) described the use of mobile dispensaries in Sweden:

> The construction industry in Sweden has developed an industry-supported foundation to provide medical, industrial hygiene and safety services to building sites via mobile

> treatment units and to collect data for research purposes. There are fifteen centers, sixteen mobile units, twenty five doctors, forty safety engineers and one hundred nurses to serve 220,000 construction workers (Ashford 1976:25).

In West Germany, the Industrial Injury Insurance Institute provides mobile units to conduct precautionary medical exams for member employers in firms with special hazards (Ashford 1976:25).

5. Private occupational health companies offer services on a fee-for-service or contractual basis. An example of a private occupational health company is Employee Care Ltd. in Toronto. This company employs 11 occupational health nurses, and offers services to businesses who need part-time services, working with employers who have up to 100 workers. Employers are visited regularly by an occupational health nurse, who updates health histories, conducts medical programs, helps with insurance claims, and offers counseling. The nurses also train employees in first aid and the proper use of personal protective equipment, and co-ordinate rehabilitation programs ("New Company Offers OH&S Services to Small Businesses," 1983:2).

Eight private occupational health and safety companies also operate in Alberta and one in Saskatchewan (Buchwald 1981:N8-N9). In the United States, a group of former factory inspectors have formed a safety advisory service to small firms, that offers counseling on safety matters (Broadhurst 1981:39). Industrial Clinics in Portland Oregon is a private company that has a large central clinic to service surrounding industries. The services provided are primarily medical; in recent years the emphasis has shifted from surgical work to preventative and consultative work (Rieke 1972:71).

6. Public health or community centers provide services. Finland is a good example of a country that uses public health centers to deliver occupational health and safety services. In Finland, the delivery of occupational health services requested by employers is an obligation of municipal health centers. In 1979, the health centers were providing services mainly in the area of health examinations and health counseling. The Institute of Occupational Health in Helsinki has published a detailed survey evaluating the need for occupational health services by small employers; the aim is toward a comprehensive national occupational health program (Tolonen 1979:2-3).

An impressive pilot program was set up in Rhode Island to help deliver services to the many small employers there. Rhode Island has a large number of jewelry manufacturers, most of which are small (average number of employees less than 100), and which have unstudied hazardous substances. In this program, a case report is referred to the Rhode Island State Department of Health, which arranges a visit to the plant by an industrial hygienist. After the initial visit, there is a joint meeting of the personnel from Rhode Island Hospital, the Department of Health, and management and/or trade unions to discuss the findings and the procedures to be followed. Procedures could include a clinical evaluation of the effects of the hazardous substance, and corrective hygienic measures to be taken. After the evaluation there is another meeting to discuss further recommendations. A comprehensive experimental service like this requires an analytical chemist, a laboratory such as in a large medical school associated with a hospital, and an industrial hygienist in a clinical setting. Some of the costs in this

program are funded by a State Department of Health grant; other costs are covered by workmen's compensation payments. The research and development costs have been supported by a grant from the Tupper Foundation (Martin 1977:82-100).

7. Voluntary educational and counseling services. Several agencies, both government and private, offer educational and counseling services to small employers who are interested. In 1977 OSHA created a Small Business Assistance Program (SBAP) to increase their effectiveness in reaching small business. This is a pilot program with five federal safety and health officers located in the mid-western United States. These officers are to act as contact points between OSHA and small business operators. They provide consultative services, referrals to other organizations, and conduct seminars, clinics and workshops for small businesses. The officers also seek to promote new safety and health activities among existing organizations and associations (Weidman 1977:6-9).

Another agency offering educational services is the National Safety Council (U.S.), in the form of a "small business package" available at $75 per year (Finch 1977:30). The Engineering Safety Service of the American Insurance Association offer seminars for small businessmen in Florida to provide information and advice on safety. Similar seminars are also offered throughout New York State by the New York Insurance Conference on Occupational Safety and Health ("Florida Safety Service for Small Businessmen," 1974:30).

8. Regular employees receive some training and devote part of their time

to occupational health and safety concerns. The most common training of regular workers is as first aiders (O'Connor 1959:566). Another use of regular workers that has been quite effective in Europe is the establishment of a safety committee or safety steward (Ashford 1976:41). Many plants in the United States also have a part time safety adviser (Safety for the Smaller Firm, 1973:10).

9. Other approaches. A few other approaches to health and safety service delivery were listed in the literature, with no examples or description of the program: share with a nearby larger company on a fee-for-services basis (Buchwald 1981:N8); services available through health centers provided by insurance companies, trade associations or insurance companies (Klem and McKiever 1952:33; U.S. Department of Labor, 1977:27).

It is interesting to note that the vast majority of the services offered are oriented toward occupational health (physicians, nurses, clinics, first aid) rather than toward safety services.

IV. EVALUATION OF OHS SERVICES FOR SMALL EMPLOYERS

There is a serious lack of evaluation reports in the literature on occupational health and safety service delivery to small employers. In discussing 5 co-operative OHS projects in Britain, Homewood remarked that the projects were pilot schemes, but have never been evaluated (Homewood 1982:35). The U.S. Department of Labor described several OHS programs offered to small business by agencies other than OSHA, and then commented,

"Mechanisms are not currently in place to evaluate these programs..." (U.S. Department of Labor 1976:35).

A. Cost

Cost figures given for different OHS programs are difficult to compare, as different kinds of services are involved. Also, the type of industry is significant in evaluating costs. Hazardous industries are more likely to need more costly programs. A final factor that complicates comparison is the year in which the program cost is reported. The literature covered a spread of years from 1952 to 1977.

In 1977 in Philadelphia, occupational health services were provided through an HMO (health maintenance organization) for two companies with several hundred employees each. For the HMO to provide total clinic and doctor services the cost was $8.50 per month per member. To provide a prepaid contract for occupational services at the clinic was $1.50 per month per member. It was mentioned that this is a conservative estimate which may need to be adjusted (Dr. Spencer in "Panel: Resource Needs and Sources," 1977:156). Another program that gave information on costs was the Hartford Small Plant Medical Service, a co-operative which has a full time nurse and part time doctor for each plant it serves. The cost of this medical service was $25.00 per employee per year in 1960(Grant 1960:119). Costs are also available for individual occupational health programs in four American companies in 1951. A gum manufacturer with 265 workers had a program consisting of a full time nurse and a part time physician, which cost an average of $30.30 per employee per year. A manufacturer of paints, varnish

and lacquers with 230 workers had a part time nurse and doctor, which cost an average of $23.00 per employee per year. A lithographic manufacturing company with an average of 180 employees had a part time doctor and nurse, which cost an average of $11.81 per employee per year (Klem and McKiever 1952:136-139). Klem and McKiever also gave the results of two surveys investigating the relative costs of occupational health services in large and small plants. A survey by the American College of Surgeons reported an average per capita cost for small employers (less than 500 employees) of $26.43. This was $10.00 higher than the per capita cost for the larger size groups, except for the largest size (over 15,000 employees), where the average was $21.51 (still lower than the cost for small employers). A 1950 survey by the National Association of Manufacturers reported the combined costs of health, medical and safety programs for 1500 companies. The average per capita costs ranged from $43.39 in plants with 250 or fewer employees to $15.67 in plants with over 5,000 employees (Klem and McKiever 1952:63-64). This evidence indicates that in 1949-50 it was more costly to operate OHS services for small employers than for larger ones. Although these findings give an indication about the relative costs of programs for small and large employers, they cannot reliably be applied to the 1980's.

B. Efficacy

Empirical evidence of the reduction of occupational injuries and illness as a result of OHS services is limited. The Chemical and Allied Products Industry Training Board described a program in which a part time safety adviser was introduced in a company that manufactured pharmaceuticals and

toiletries. The company reported that after the institution of the program "there were no notifiable accidents and no lost days of production for the first six months of the year" (compared to "a number" of lost days and accidents in the six months previously) (The Chemical and Allied Products Industry Training Board, 1973:11). The Hartford Small Plant Medical Service claimed credit for these results: 1) substantial reduction in accident frequency, absences and employee separations; 2) higher output per worker through better job placement (Grant 1960:119). These two reports do not represent rigorous empirical evaluation of reduced accident, illness and injury, but they are all that was available in the literature reviewed. The literature is very inadequate in this area.

C. Cost-effectiveness

There were some studies of cost-effectiveness of OHS service delivery, but again these were done in the late forties and early fifties, and do not generalize to the current situation in the 1980's. Klem and McKiever (1952) discussed the cost-effectiveness of several plant programs. One plant with 160 employees reduced their compensation losses by $4500 in the first year of the program, compared with $1200 in expenses for the program. Another plant with 220 employees reduced compensation losses by $3300, compared with $2500 spent on a medical program. A third plant hired a part time industrial nurse at the cost of $1000 per year; the compensation losses in the first year of the program were reduced by $4700 (Klem and McKiever 1952:66). Another plant with 115 employees spent $600 to install a dispensary and $1660 a year to run it. In the first year they saved $3420 in reduced absenteeism. A foundry

with 225 employees reported a cost of $200 to train workers, such as moulders. As a result of an in-plant medical service the worker turnover was reduced (Klem and McKiever 1952:66-67; Klem and McKiever gathered their cost-effectiveness examples from Heiser 1947, Morse 1948 and Pharris 1950. See the bibliography for complete references.) These figures are fairly impressive, but are not current.

The existing OHS literature is severely lacking in current empirical evaluation of OHS service delivery to small employers. There are only scattered reports of costs, making it impossible to compare the economics of the different approaches to service delivery. The literature surveyed has no rigorous examination of the effectiveness of OHS services in reducing injury and illness. The cost-effectiveness studies are too old to apply to the present situation, although they may give some information on the techniques that are useful when doing a cost-effectiveness study for small employers.

V. RECOMMENDATIONS

These recommendations cluster around questions about OHS service delivery in Alberta that are left unanswered by the existing literature.

1. What kind of definition of "small" is useful in determining OHS service delivery approaches in Alberta? The literature contains numerous definitions of small from all over the world, and also contains a caution that such definitions must be flexible according to country, industry, and other factors. Therefore, I recommend that the definition of small employer remain flexible, with an appropriate definition chosen for each kind of

industry. Where a broad definition is required, I recommend that small employers be defined as "those with 50 or less employees" in Alberta. This definition was chosen because it is congruent with other definitions in the literature (several other countries use this definition).[5] For individual industries, "25 or less employees" is a good choice for construction. A higher figure such as "100 or less" is appropriate for manufacturing. It would be helpful to have an occupational health and safety expert give suggestions as to what size factors are important in Alberta business, and to look into the possibility of individual definitions for some of the other kinds of industries (forestry, agriculture, service, trade, etc.).

2. What services do small employers need in Alberta? There is a moderate amount of research in the literature on the small employer's need for OHS services, which justifies this topic as an area of concern and interest. While research on the need for OHS services in Alberta is limited, statistical data indicates that concern over health hazards in small businesses is justified. In 1981, 42% of small employers in Alberta were in the four high hazard industry sectors (agriculture, forestry, manufacturing, and construction), compared with 34% of large employers in these sectors. Almost one third of small employers are concentrated in the construction industry, which accounted for the largest percentage (35%) of fatalities

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5. However this definition has the disadvantage of being different from the definition of "forty or less" used in the analysis of small employers in Alberta by MacKinnon, 1983. Choice of definition is an arbitrary matter. If international comparison is considered more important, then the "50 or less" category is a good choice; if one wants to continue building on the existing definition and available data analysis of small employers in Alberta, then the "40 or less" category is a good choice.

investigated by the Occupational Health and Safety Division from 1977 to 1981. This statistical evidence points to the need for additional investigation in this area.

I recommend a study of small workplaces in Alberta to document actual health hazards and to determine the specific need for OHS services. A research project modelled on Tolonen's work in Finland, with interviews of small employers and a walk-through survey of small workplaces would provide valuable information for assessing the need for OHS services. The information gathered would also assist in selecting the appropriate approach(es) for service delivery where the need is thoroughly documented.

The survey recommended above is perhaps idealistic. It would yield extensive information on which to base decisions about OHS service delivery, but would also be costly and time-consuming. An alternative recommendation is to focus on services for small employers in the hazardous industries where they are concentrated. The construction industry is an obvious choice because of its hazardous nature, its high rate of fatality investigations, and the sizable proportion of small employers involved. A walk-through and interview survey, as discussed above, could be conducted for the construction industry only. If the study confirms the small employer's need for OHS services in the construction industry, a pilot project for service delivery to these employers could be developed and evaluated.

3. In connection with the above pilot project, I recommend that these areas also be examined:

a. To what extend are small employers in construction utilizing existing services? The literature suggested that small employers often are reluctant to accept and implement OHS services. It is possible that the needs of small employers in the construction could be met by existing service delivery mechanisms, if the employers were motivated to use them.

b. A study of the attitudes and social background of small employers[6] would help in determining why existing services are not utilized fully (if they are not), and would yield information on how to motivate small employers. Such a study would also provide valuable insight as to what service delivery approach will likely be most successful among small employers in the construction industry in Alberta.

c. If a service delivery approach is implemented as a pilot project, it is necessary to develop a format or mechanism for program evaluation encompassing cost, cost-effectiveness, and other relevant factors. The literature on service delivery to small employers is definitely lacking in the area of OHS program evaluation, but information on program evaluation for larger employers could be adapted. Appendix A also gives some guidelines on factors to consider in evaluating OHS service delivery programs.

In summary, the ideal approach would be to survey small employers in all industries in Alberta to document health and safety hazards and gather other

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6. Homewood referred to the importance of social background in Britain when she asked this question, "Must the social background and culture (between small firms and firms or agencies that deliver OH services) be similar if OH services in small industries are to grow?" (Homewood 1982:183-184).

information relevant to OHS service delivery. A more practical alternative approach focuses on small employers in the construction industry. It is recommended that a survey documenting health and safety hazards and gathering other relevant information be carried out for small employers in the construction industry. If the survey confirms the need for OHS services, a pilot program for service delivery to small employers in construction could be developed, implemented and evaluated. In connection with the possible development of a pilot program for service delivery, it is recommended that these areas also be studied: present utilization of OHS services by small employers in construction; attitudes and background characteristics of small employers; the design of a program evaluation mechanism.

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** highly recommended articles
* recommended articles

APPENDIX A: FACTORS TO CONSIDER IN THE EVALUATION OF OHS PROGRAMS

FACTORS TO CONSIDER IN THE EVALUATION OF OHS PROGRAMS

Klem and McKiever (1952) reported ten ways in which OHS programs contribute to a company's efficient operations. These ten items provide some information on factors to consider in evaluating OHS programs. Klem and McKiever said:

(Occupational health) programs are reported to pay demonstrable dividends in at least ten ways that are vital to the efficient operation of every company:

1. For employees, a plant medical service means a long step toward good health and good working conditions.
2. It means increased efficiency on the job, both manual and mental.
3. It means less time lost because of illness.
4. It means fewer accidents - health and safety are Siamese twins.
5. For the company, a sound medical service means less money paid out for workmen's compensation.
6. It means a sharp reduction in labor turnover - good working conditions will take you a long way toward attracting and holding the best qualified man for the job.
7. It means more production for each payroll dollar.
8. For your customers industrial hygiene means the increased satisfaction that is produced by healthy teamwork, with every possible man on the job and alert to deliver a product of the best quality in sufficient quantity and on time.
9. A medical program is basic to your whole public relations status. If you do your share toward keeping employees healthy, they will do a far better than average job of speaking loud, often and favorably about their boss, their factory and their product.
10. Finally, plant medical service pays dividends in pride, pride in having everything shipshape, pride in doing the job right, the sort of pride which makes small companies grow into big ones. (Klem and McKiever 1952:68)

POOR

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